



DEPARTMENT OF THE NAVY

OFFICE OF THE SECRETARY

WASHINGTON, D.C. 20350-1000

SECNAVINST 5234.2A

ASN(RDA)

28 April 1994

SECNAV INSTRUCTION 5234.2A

From: Secretary of the Navy

Subj: ADA PROGRAMMING LANGUAGE POLICY

- Ref:
- (a) DODD 5000.1 of 23 Feb 91, "Defense Acquisition"
  - (b) DODI 5000.2 Change 1 of 26 Feb 93, "Defense Acquisition Management Policies and Procedures"
  - (c) DOD 5000.2-M of 23 Feb 91, "Defense Acquisition Management Documentation and Reports"
  - (d) SECNAVINST 5000.2A of 9 Dec 92, "Implementation of Defense Acquisition Management Policies, Procedures, Documentation, and Reports"
  - (e) SECNAVINST 5200.32A of 3 May 93, "Acquisition Management Policies and Procedures for Computer Resources"
  - (f) DODD 8120.1 of 14 Jan 93, "Life-Cycle Management (LCM) of Automated Information Systems (AISs)" (NOTAL)
  - (g) DODI 8120.2 of 14 Jan 93, "Automated Information System (AIS) Life-Cycle Management (LCM) Process, Review, and Milestone Approval Procedures" (NOTAL)
  - (h) SECNAVINST 5231.1C of 10 Jul 92, "Life Cycle Management Policy and Approval Requirements for Information System Projects" (NOTAL)
  - (i) ASD(C3I) memo of 17 Apr 92, "Delegations of Authority and Clarifying Guidance on Waivers from the Use of the Ada Programming Language" (NOTAL)
  - (j) DODD 3405.1 of 2 Apr 87, "Computer Programming Language Policy" (NOTAL)
  - (k) SECNAV memo for ASN(RDA) of 18 Oct 93, "Delegation of Ada Programming Language Waiver Authority" (NOTAL)

- Encl:
- (1) Ada Waiver Request Format
  - (2) Definitions

1. Purpose. To implement policy which requires the use of the programming language Ada in the development or maintenance of software for systems managed under references (a) through (h).

2. Background. Public Law 102-396, Section 9070, requires that, where cost-effective, all Department of Defense (DOD) software



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28 APR 1994.

shall be written in the programming language Ada in the absence of special exemption by an official designated by the Secretary of Defense (SECDEF). References (b), (i), and (k) provide delegation authority and clarifying guidance on waivers from the use of the Ada Programming Language.

3. Cancellation. SECNAVINST 5234.2.

4. Applicability. This policy applies to systems and software managed under references (a) through (h), including all Science and Technology (S&T) systems developments and major software upgrades intended to be deployed and maintained by the Department of Navy. It covers all life cycle phases of those systems and software, and all Department of the Navy components and activities, including their contractors. This policy does not apply retroactively to the following:

a. Systems that have entered production and deployment (passed Milestone III of references (a) through (e) as of 1 June 1991)

b. Systems managed under references (f) through (h) that have passed Milestone II as of 1 June 1991.

c. Systems managed under references (a) through (e) for which a documented language commitment was made in accordance with previous policy prior to 1 June 1991.

This policy does apply at the first major software upgrade of the above systems.

5. Policy

a. References (b), (i) and, (j) require the use of Ada and validated Ada compilers for all new systems development and for all major software upgrades regardless of size, cost, or functional application. Use of Ada is presumed cost-effective for all new software developments or major software upgrades. In such cases, Ada must be used unless a waiver is granted.

b. Waivers are required for the use of programming languages other than Ada except for:

(1) Commercial-off-the-shelf (COTS) applications software that is not modified by, or for, or maintained by the DOD.

(2) Commercially available off-the-shelf Advanced Software Technology (AST) that is not modified by, or for, or maintained by the DOD. This provision does require the host application language used with an AST to be Ada.

28 APR 1994

(3) Programming Languages required to implement vendor provided updates to commercially supplied off-the-shelf software. Use of such languages shall be restricted to implementing the vendors' updates.

c. References (i) and (j) only permit waivers based on the substantiation of the economic analysis on a specific system or subsystem.

## 6. Procedures

a. Waiver requests shall be submitted to the Assistant Secretary of the Navy (Research, Development and Acquisition) (ASN(RDA)) for review, approval, or forwarding when applicable, to the appropriate Office of the Secretary of Defense (OSD) Waiver Approving Official.

b. The format for waiver request is provided in enclosure (1) and shall be based on an economic analysis of the total system life-cycle cost benefits. These cost estimates must include all development, investment, operation, support and disposal costs for each alternative extending through the useful life of the system and must be based on quantitative data along with identified sources (e.g., recognized studies and reports, cost models, historical data, established standards, etc.).

## 7. Responsibilities

a. ASN (RDA) shall:

(1) Ensure the Ada Policy and procedures in this instruction are implemented.

(2) Review requests for waivers to Ada policy and make final determination for those requests for which delegation authority is granted to the military services. In accordance with reference (k), the authority to make such a final determination may not be redelegated and may be exercised only by a civilian officer of the DOD appointed by the President with the advice and consent of the Senate.

(3) Review and forward waiver requests to Ada policy, when applicable, to OSD in accordance with Change 1 to reference (b) and references (i) and (k).

(4) Ensure Ada-related technology insertion in the Department of the Navy.

b. Chief of Naval Operations, Commandant of the Marine Corps, Chief of Naval Research, and Assistant for Administration, Office of the Under Secretary of the Navy shall ensure compliance with this instruction within their respective organizations.

SECNAVINST 5234.2A

28 APR 1994.

c. SYSCOM Commanders, Program Executives Officers, Direct Reporting Program Managers, and Supporting Activities shall ensure compliance with this instruction within their respective programs and projects.

d. Milestone Decision Authorities (MDAs) shall ensure full compliance for all programs under their purview. The MDA shall not permit non-compliant programs to pass their next milestone review until full compliance has been achieved.



Nora Slatkin  
Assistant Secretary of the Navy  
(Research, Development and Acquisition)

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28 APR 1994

**ADA WAIVER REQUEST FORMAT**

The waiver request is prepared by the applicable program/project office and forwarded to ASN(RDA) in the following format:

Cover Letter: The letter should include a focal point (office symbol and phone) and a brief summary of the contents of the package. Pertinent details are to be included in the enclosures to the cover letter. The package should include the enclosures below and should not exceed ten pages in length.

Enclosure 1, Executive Summary: This enclosure should include a description of the capabilities needed, rationale and justification for use of programming languages other than Ada (to include cost, schedule performance, reuse potential, portability and risk), a description of the proposed system (hardware, software, firmware), and justification and rationale for selecting the proposed system.

Enclosure 2, System/Project Descriptions: This enclosure should include details of the proposed system, to include acquisition and contracting status (to the extent it is pertinent to the waiver decision), and description of both host and target hardware, software and firmware.

Enclosure 3, Economic Analysis: This enclosure should provide a cost and benefit analysis which clearly shows that the proposed solution is more cost effective and beneficial to Department of the Navy over the entire system's life cycle (to include post deployment software support (PDSS)) than the Ada alternative. This analysis must address all costs for both the Ada solution and the proposed alternative to include development, investment, operating, support, and disposal costs. Costs which have already been incurred at the time an analysis is made are "sunk costs" and should not be included in the comparison of alternatives.

Current studies indicate PDSS costs dominate the system life cycle cost and therefore, the following PDSS cost factors, at a minimum, need to be considered: application domain, staff (capability and experience in the language and tools, stability, and training), complexity and size, software development and maintenance environment, system or subsystem age, portability, hardware stability, reengineering/reuse, module independence, system or subsystem verification and validation, program style, reliability and availability and maintainability (RAM), security, and privacy restrictions.

Enclosure 4, Transition Plan: This enclosure should describe future plans for moving to Ada if the waiver is approved.

SECNAVINST 5234.2A

28 APR 1994.

Address all applicable factors, including language features, compilers, environments, bindings, training, education, schedules, personnel, cost and hardware.

Enclosure 5, Risk Analysis: This enclosure should describe risks such as schedule, performance, security and other non-economic issues associated with both the Ada and non-Ada solutions.

Enclosure 6, Statement of Maintenance: This enclosure (limited to one page) must identify the responsible maintenance activity (in-house or contractor) associated with the software.

28 APR 1994

## DEFINITIONS

a. Advanced Software Technology (AST). Software tools, life-cycle support environments (including program support environments), non-procedural languages (4GLs), modern database management systems (DBMSs), and other technologies that provide improvements in productivity, useability, maintainability, portability, and other benefits, over those capabilities commonly in use.

b. Commercial-Off-The-Shelf (COTS) Software. Software (including operating systems, utilities and stand-alone applications programs) already developed, tested, and sold to other DOD or commercial customers, supported by a commercial vendor over the system life cycle, and requiring no government modifications over the system life cycle.

c. Fourth Generation Languages (4GLs). Non-procedural computer programming languages which consist of compact, English-like statements which describe the overall tasks a computer is to carry out without specifying any individual steps or their order. For the purpose of this policy, 4GLs include products which generate High Order Language (HOL) code.

d. Major Software Upgrade. A change to the system architecture which would result in a cumulative one-third modification to a computer software configuration item (DOD-STD-2167A) or subsystem specification (DOD-STD-7935A) within any 5-year period and as measured in compilable source lines of code. Modification includes addition, deletion, or change exclusive of routine maintenance.

e. Milestone Decision Authority. The individual designated to approve entry of an acquisition into the next phase of life cycle management in accordance with applicable directives.

f. Science and Technology. Science and Technology (S&T) is defined as all Basic Research (6.1), Exploratory Development (6.2), and Advanced Technology Development (6.3A).

g. Special Exemption. Same as a waiver.

h. Validated Ada Compiler. A compiler registered with the Ada Joint Program Office (AJPO). A project-validated compiler, which is a compiler that is registered with the AJPO at project start or Milestone 0, is considered validated for the entire life cycle of the designated project.

i. Waiver. A waiver is approval to deviate from policy contained in this instruction which requires a detailed justification to support.

Enclosure (2)